REMARKS

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application is respectfully requested.

Applicants assert that the present invention is new, non-obvious and useful. Prompt consideration and allowance of the claims is respectfully requested.

Status of Claims

Claims 1, 3-4 and 7-9 are pending. Claims 1, 3-4 and 7-9 have been rejected. Claim 1 has been amended. Applicants respectfully assert that the amendments to the claims add no new matter.

35 U.S.C. § 103 Rejection

In the Office Action, the Examiner rejected claims 1, 3-4 and 7-9 under 35 U.S.C. § 103(a), as being unpatentable over US 5,322,628 (Yan) in view of Turkevich et al.

Applicants have amended claim 1 and respectfully traverse the rejection of the claims based on Yan in view of Turkevich et al.

Amended Claim 1 is directed to a method for the preparation of adsorbent compositions for removing pesticides like chlorpyrifos, malathion and other organo halogen/sulphur pesticides comprising metallic gold/silver nanoparticles having a size which is up to 150 nm deposited on activated alumina and/or magnesia, wherein said metallic gold/silver nanoparticles are prepared by:

(a) diluting silver nitrate or $HAuCl_4\ 3H_2O$ in water;

(b) heating;

(c) adding a sodium citrate solution;

(d) heating;

(e) loading silver and gold nanoparticles on activated alumina and/or activated magnesia from a solution under wet conditions; and

f) washing the loaded activated alumina and/or activated magnesia under wet conditions.

According to the Examiner on page 2 of the Office Action, Yan discloses loading gold particles on alumina, the gold "obviously being in the form of nanoparticles" since it applies to the alumina using a similar process in which a porous substrate is impregnated with a gold salt solution containing a reducing agent, and subsequently heated.

It is respectfully asserted that the above process disclosed by Yan would result in elemental gold particles as per their own disclosure, not necessarily nanoparticles thereof. It is further noted that Yan does not provide any supporting data (spectroscopy or microscopy) and further, Yan does not mention any such data throughout the patent application, to prove that the elemental gold on the support prepared therein is in nano dimensions. This is in contrast to the pending application. Figure 1 of the present application presents the UV-visible spectrum of the gold nanoparticles produced showing the surface plasmon resonance feature (see paragraph [0020] of the Application as published), which is characteristic of the presence of metal nanoparticles. Elemental gold, as prepared by Yan, would not have this feature. Further, Yan does not provide absorption (UV-visible) spectrum or microscopy images to confirm that the elemental gold on support is nanoparticles.

Further, Yan did not intend to produce nanoparticles.

Additionally, the Examiner noted that Yan fails to specify the steps of producing the gold nanoparticles, as recited in claim 1; however, according to the Examiner, Turkevich et al. teach that such a technique is known in the art. Further, according to the Examiner, it would have been allegedly obvious to have modified the process of Yan so as to include the steps of preparing the gold nanoparticles as suggested by Turkevich et al.

It is respectfully submitted that combining the teachings of Turkevich et al. with those of Yan, would not result in the presently claimed invention, since the method disclosed by Turkevich et al. is for the preparation of nanoparticles in a solution, while Yan's method is for the preparation of elemental gold (or silver) on a substrate by first loading gold ions on the solid substrate, and then reducing them by heat or reducing gases, in order to convert

them into elemental gold. Thus, since Turkevich et al. teach the preparation of nanoparticles in a **liquid state**, while Yan discloses the production of elemental silver/gold particles on a **solid** substrate, there would be no motivation to combine the two references since one skilled in the art would not think to combine a method for the preparation of particles in a solution with a method relating to the preparation of particles on a solid substrate. As specified in amended claim 1, the nanoparticles are loaded onto the alumina/magnesia substrate **from a solution, under wet conditions**. And therefore, the process disclosed by Yan is irrelevant to the claimed invention.

Further, it is respectfully submitted that Turkevitch is directed to the preparation of nanoparticles in solution, and does not relate at all to transferring the nanoparticles from the solution to a solid substrate. Thus the nanoparticles according to Turkevitch remain in the solution. However, such a method cannot be used according to the method for preparing the compositions, as recited in pending claim 1, since as recited in claim 1 ("... comprising metallic gold/silver nanoparticles ... deposited on activated alumina or magnesia ..."), the nanoparticles of the present invention must be loaded onto a substrate, not be in solution, as taught by Turkevich et al.

It is further respectfully submitted that in order to effectively remove pesticides, the nanoparticles must be in the form of a monolayer coating the alumina/magnesia substrate. Thus, the method of synthesis of nanoparticles, according to amended claim 1, involves the use of a sodium citrate solution, which is a protecting agent that exists as ions on the nanoparticle surface. Such agents ensure that the synthesized nanoparticles are isolated and do not aggregate in the solution. Further, according to claim 1, the nanoparticles are loaded from a solution, under wet conditions, onto a suitable alumina/magnesia substrate and subjected to washing (e.g. in order to remove the unanchored nanoparticles) under wet conditions. Such a procedure will form a monolayer of nanoparticles loaded on the substrate surface, without aggregation. Thus, since the solution contains a citrate protecting agent, the nanoparticles will not aggregate in the solution, and further, since they are loaded onto the substrate **directly from the solution**, they will attach, in monolayer, to the substrate. Further washing under wet conditions, according to amended claim 1, ensures that any additional nanoparticles are washed away from the substrate, leaving a monolayer of nanoparticles

coating the alumina/magnesia substrate. The nanoparticle loading according to claim 1 was adopted so as to obtain maximum surface loading while preserving the properties of the nanoparticles for the end use (which is the pesticide removal).

However, if deposition of the nanoparticles is performed on a dry substrate, as described by Yan, multilayer adsorption will occur and the nanoparticles will aggregate on the substrate, and even if the substrate were washed, the aggregated nanoparticles would remain attached thereto. Such a substrate, coated with aggregated nanoparticles, will not effectively be able to remove pesticides. Thus, even if one were to prepare nanoparticles according to Turkevitch et al., which do not aggregate in the solution, the loading of such nanoparticles onto a substrate **under dry conditions** according to Yan would cause the aggregation of the nanoparticles on the substrate, thereby losing pesticide removal properties. Thus, a composition resulting from the unlikely combination of Turkevich and Yan would not be the same as that of the presently claimed invention and would not produce a substrate loaded with nanoparticles that would be efficient in removing pesticides.

It is further submitted that the deposition of nanoparticles on activated alumina/magnesia would have been performed only for the preparation of adsorbent compositions for removing pesticides, as recited in amended claim 1. Thus, since neither Yan nor Turkevitch relates to the removal of pesticides, the two would not be considered by an artisan striving to prepare a composition for pesticide removal, and therefore, neither Yan nor Turkevitch, nor the combination thereof, is relevant to the invention of amended claim 1.

It is respectfully submitted that independent claim 1 is allowable. Each of claims 3-4 and 7-9, depends, directly or indirectly, from claim 1, and therefore includes all of the limitation of claim 1. Thus, Applicants respectfully assert that claims 3-4 and 7-9 are also allowable. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection to independent claim 1, and to dependent claims 3-4 and 7-9, dependent therefrom.

Conclusion

In view of the foregoing amendments and remarks, Applicants assert that the pending claims are allowable. Their favorable reconsideration and allowance is respectfully requested.

Should the Examiner have any question or comment as to the form, content or entry of this Amendment, the Examiner is requested to contact the undersigned at the telephone number below. Similarly, if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

Please charge any fees associated with this paper to deposit account No. 50-3355.

Respectfully submitted,

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Dated: November 22, 2010

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